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Distillers Dried Grains Supplementation of Fall-calving Cows or Calves Grazing Stockpiled Forage During Winter (Progress Report)

A.S. Leaflet R2270

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Summary and Implications

Six 10-acre pastures containing Fawn endophyte-free tall fescue were strip-grazed by 4 pregnant fall-calving cows with calves from mid-November through March. Treatments applied to the cows in the six pastures included: Minimal supplementation (Minimal treatment), creep feeding a DDGS-soy hull pellet to calves (Creep treatment), or DDGS supplementation to cows (DDGS treatment). Cow weights and body condition scores and calf weights were measured over the winter grazing season. Over the season, calves in the Creep treatment had greater body weight gains than calves in the DDGS and Minimal treatments (3.1, 2.3, and 2.2 lbs/day, respectively). Partly because of a dry period while stockpiling forage and cold temperatures combined with snow and ice in late winter, cows in the Minimal and Creep treatments received 392 lb DDGS/cow over the grazing season compared to 948 lb DDGS/cow in DDGS treatment. As a result, there were no significant differences in cow BW or BCS between treatments throughout the winter grazing season. No significant differences were found in forage mass or the concentrations of CP, ADF, NDF, ADIN, or IVDMD of pasture samples collected before or during winter grazing between treatments. Results imply that creep feeding a corn-soy hull pellet will increase calf body weight gains. However, neither creep feeding calves nor supplementing DDGS to cows to maintain a condition score of 5 affects body weights or condition scores of cows grazing stockpiled forages in comparison to cows that are supplemented only when necessary because of excessive cold or ice.

Introduction

Feed costs are the most expensive input for cow-calf operations. As a result, feed costs are a major factor determining the overall profitability of an operation. The ability to decrease the amount of harvested and stored forages fed to cows during winter by grazing forages stockpiled during late summer and fall can increase the profitability of an operation.

Grazing of stockpiled forages has significantly reduced the amounts of hay needed to maintain pregnant spring-calving cows or lactating fall cows over winter. However, weaning weights of fall calves whose dams grazed stockpiled forages were 20% less than those of spring calves from similar cows.

With the recent and expected future growth in the ethanol industry, there is a ready supply of co-products that may become increasingly economical to feed. The question needs to be asked how co-products can be used to benefit feeding cattle in the cow-calf operations. There has been a significant amount of research validating co-product use in finishing diets. But less research has focused on the potential to feed co-products to lactating beef cows and calves as an energy and protein supplement. In a winter grazing system for fall-calving cows, DDGS as a supplement for either the cows or calves might be used to enhance calf body weight gains and extend the use of pasture forage.

The objective of this research was to evaluate the effects of supplementing DDGS to either fall-calving cows or fall calves grazing stockpiled forage on cow body weights and condition, calf body weights, and change in forage mass and composition over winter.

Materials and Methods

At the ISU Beef Nutrition Farm near Ames Iowa, two 30-acre pastures containing Fawn endophyte-free tall fescue were divided into six 10-acre pastures. Forage from the pastures was harvested as hay in early June and August. After the hay was harvested in August, pastures were fertilized with 40 lb N/acre. Forages were stockpiled and divided into 8 paddocks in preparation for winter grazing. On November 15, 2006, 24 Simmental x Angus fall-calving cows (initial body weight (BW), 1474 lb; initial body condition score (BCS), 6.15) with calves (initial weight, 301 lb) were allotted to the six pastures to strip-graze. Pastures were assigned to one of three supplementation treatments: 1) Minimal supplementation, 2) Creep, and 3) DDGS. In the Minimal supplementation treatment, cows received DDGS only when excessive snow and ice inhibited grazing or mean BCS of cows in a pasture dropped below 4.33 and calves received no supplement. In the Creep treatment, cows received DDGS at the same level as the Minimal treatment, and calves had ad lib access to a pelleted creep feed (45% DDG, 45% soybean hulls, 5% molasses, and 5% vitamin-mineral premix). In the DDGS treatment, cows received DDGS to maintain a BCS of 5 on a 9 point scale (as

estimated by the Cornell Net Carbohydrate and Protein System) and calves received no supplement. Body weights were measured with no shrink every 28 d for both cows and calves, and BCS were estimated by two individuals bi-weekly for the cows until weaning of the calves on March 29, 2007.

Pastures were sampled every 28 days from two locations in each grazed and ungrazed paddock of the pastures. Grazed or ungrazed samples were composited by pasture, weighed, dried at 140° F for 48 hours, ground, and analyzed for NDF, ADF, CP, ADIN, and IVDMD.

Statistics were analyzed using the mixed procedure of SAS for both the forage and cow-calf data. Forage was analyzed with day of grazing, block, treatment, grazing status (grazed or ungrazed), and grazing status by treatment as the model. The cow-calf data were analyzed by month with block and treatment as the model. Contrasts between treatments were conducted for variables with significant treatment effects.

Results and Discussion

Cows in pastures with the DDGS treatment required 968 lb DDG/cow to attempt to maintain a BCS of 5 over the winter. Because of the low yield of stockpiled forage in the fall and the large amount of snow followed by cold temperatures in February and March, cows in pastures with the Minimal supplementation and Creep treatments were fed an average of 392 lb DDG/cow over periods from February 2nd to March 2nd and March 14th to March 25th. Calves in pastures with the Creep treatments consumed 875 lb creep feed/calf over the winter. Inasmuch as the costs of the DDGS and creep feed were \$127.60 and \$223.86/ton, the costs of the supplements for both cows and calves in the Minimal supplementation, Creep and DDGS treatments were \$25.01, \$122.92, and \$60.48/cow-calf pair.

As a result of the DDGS supplementation to cows in all treatments, there were no differences in cow BW and BCS

between treatments even in February and March. Body condition score of cows in the Minimal and Creep treatments never dropped to the point that supplementation was needed to maintain a BCS of 4.33.

Average daily gains of calves from the Minimal, Creep, and DDGS treatments were 2.2, 3.1, and 2.3 lb/d ($P < 0.01$), resulting in BW gains of 295, 415, and 313 lb over the 135-day winter grazing period (Table 1). The final BW of calves at weaning were 600, 701, and 626 lbs for Minimal, Creep, and DDGS treatments, respectively, ($P < 0.05$).

As expected, there were no significant differences in the initial forage mass (2,258.6 lbs/acre) or the concentrations of CP (10.3%), NDF (54.7%), ADF (30.3%), ADIN (6.5%), and IVDMD (56.7%) of the stockpiled pastures between the treatments (Table 2). While supplementation of cows with DDGS or calves with a DDGS-based creep feed increased calf ADG, supplementation did not significantly affect the rates of forage disappearance or change in the concentrations of NDF, ADF, or CP ($P > 0.10$) in either grazed or ungrazed portions of the pasture. Although the change in forage mass tended to be greater in ungrazed portions of the pastures than in grazed portions of the pasture, the rate of decrease in IVDMD was greater ($P < 0.10$) in ungrazed portions of the pasture than in grazed portions of the pasture. This result implies that leaching of nutrients may be reducing the nutritional value of the stockpiled forage. However, the greater increase in ADIN in grazed portions of the pastures than ungrazed portions of the pasture seems to contradict this explanation.

While supplementation of cows with DDGS or calves with a DDGS-based creep feed increased calf ADG, it did not significantly affect cow weight, BCS, or forage removal. This result seems to imply that either the substitution of DDGS for forage was not large, or that any effects of DDGS supplementation on forage use were masked by weather losses of the forage.

Table 1. Initial and seasonal changes in body weight and condition scores of cows and daily gains of calves in the Minimal supplementation, Creep, and DDGS treatments.

	Cow BW		Cow BCS		Calf BW	
	Initial	Seasonal Change	Initial	Seasonal Change	Initial	ADG
Minimal	1486 ^a	-131 ^a	6.33 ^a	-1.69	305	2.18 ^a
Creep	1498 ^a	-140 ^a	6.08 ^b	-1.65	286	3.07 ^b
DDGS	1438 ^b	-89 ^b	6.04 ^b	-1.54	313	2.32 ^a

^{ab}Differences between means with different superscripts are significant, $P < 0.10$.

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Table 2. Forage mass and composition from grazed and ungrazed paddocks in pastures grazed by cows in the Minimal supplementation, Creep, and DDGS treatments.

	Daily Change		
	Initial	Grazed	Ungrazed
Forage mass, lb DM/acre	2258.6	-11.07	-4.46
	% of DM		
CP	10.3	0.002	0.003
NDF	54.7	0.101	0.101
ADF	30.3	0.111	0.097
IVDMD	56.7	-0.135 ^a	-0.171 ^b
	% of total N		
ADIN	6.5	0.056 ^a	0.037 ^b

^{ab}Differences between means with different superscripts are significant, P<0.10.